

Chapter 19

Environment and Sustainable Resource Management

19

ENVIRONMENT AND SUSTAINABLE RESOURCE MANAGEMENT

I. INTRODUCTION

19.01 In tandem with Malaysia's rapid economic growth during the Sixth Plan period, the Government implemented measures to address environmental problems to ensure that productivity and economic growth were not compromised in the long term. Several institutional mechanisms and programmes were put in place to combat environmental pollution as well as conserve natural resources. In addition, Malaysia became party to several international environmental conventions including those promulgated at the United Nations Conference on Environment and Development (UNCED) and played an active role in promoting partnership between the North and the South in combating global environmental deterioration, particularly through the transfer of financial resources and environmentally-sound technologies from the North as well as the rationalization of trade and environment linkages.

19.02 During the Seventh Plan period, Malaysia will continue to take appropriate action to ensure that development is sustainable and balanced. Towards this end, environmental and conservation considerations will increasingly be integrated with development planning. In order to further substantiate efforts to promote sustainable development, innovative economic mechanisms will be instituted to supplement legislative and enforcement means to encourage the private sector to adopt and develop environmentally-sound technologies. Both the public and private sectors will increasingly work in tandem to address the requirements of sustainable development which is compatible with long term economic development. Environmental awareness programmes will be stepped up in order to instil knowledge as well as a sense of social responsibility into the general population, as sustainable development begins with the individual citizen.

II. PROGRESS, 1991-95

19.03 A number of appropriate measures was instituted during the Sixth Plan period to reduce the impact of environmental degradation. The *institutional framework* was strengthened in order to establish an integrated approach to environmental and resource management. The National Development Council expanded its mandate in 1993 to incorporate environmental dimensions into development planning, thus providing coordination at the highest level and promoting a holistic approach to the management of the environment and natural resources. Concurrently, the capacity of the Department of Environment (DOE) was further strengthened with the setting up of branches in Wilayah Persekutuan Kuala Lumpur, Negeri Sembilan and Kelantan. In addition, special environmental units were established in some Local Authorities as well as in public and private corporations.

19.04 Efforts to improve the *legal and regulatory framework* were carried out. Related environmental legislations were reviewed in 1993 and the recommendations of the review are in the process of being implemented. In addition, new environment-related legislation were promulgated to cover sewerage services, natural resources, the management of hazardous chemicals, the use of chloroflourocarbons (CFCs) as well as occupational safety and health. The DOE initiated the formulation of new environmental legislation to address problems arising from marine pollution, tanker-cleaning, chemicals and metal industries as well as waste incineration. New guidelines incorporating environmental considerations were prepared by the DOE for investors and developers. At the State level, Sarawak instituted the Natural Resources and Environmental Ordinance to deal effectively with its environmental, resource and pollution issues.

19.05 In order to measure systematically the *health impact* of environmental degradation with the view to improving the design of environmental policy, plans were drawn up for the establishment of an environmental health centre to monitor health impacts and propose mitigation measures. This is because exposure to high pollution levels may lead to chronic sicknesses and diseases.

19.06 Despite the Government's effort in implementing environmental laws and regulations, it was found that enforcement measures need to be further enhanced to ensure that laws and regulations are fully complied with. Furthermore, polluters would be required to comply rather than to pay penalties, through a stiffer penalty structure, the use of economic instruments as well as through environmental education and awareness.

Environmental Management

19.07 The Government was constantly vigilant of changes in environmental quality brought about by the rapid development process. In order to improve the quality of the environment in the long term, various programmes were implemented during the Plan period to address environmental concerns.

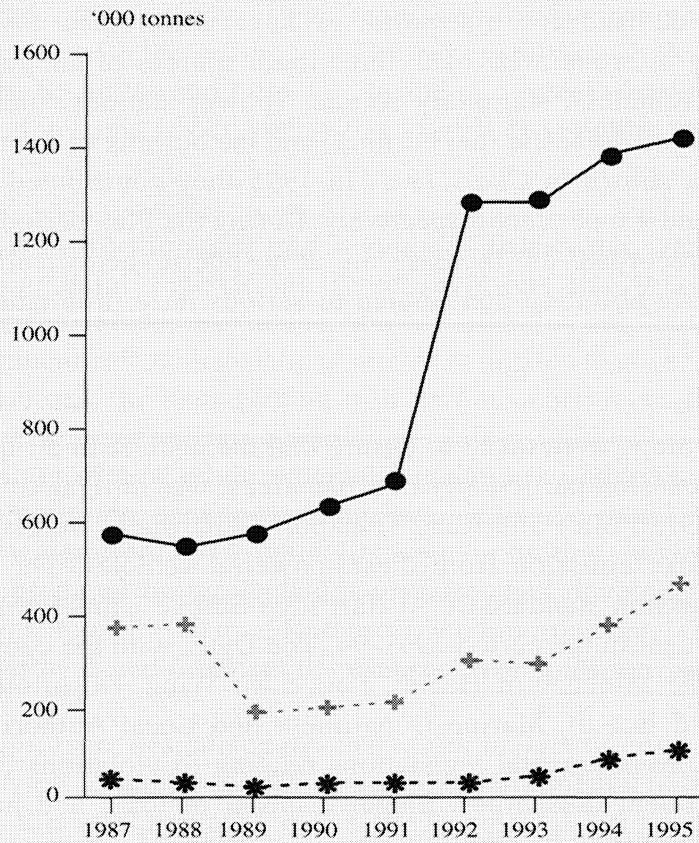
19.08 *Air Quality.* Rapid industrial growth and urbanization together with the high demand for transportation have contributed towards air pollution, especially in urban areas. The three main sources of air pollution were mobile sources (vehicles), stationary sources (power stations, industrial fuel burning processes and domestic fuel burning) and the burning of municipal and industrial wastes, as shown in *Chart 19-1*. In 1995 they contributed 75.1 per cent, 20.3 per cent and 4.6 per cent respectively. During the Plan period, the meteorological stations recorded an increase in atmospheric acidification. Transboundary atmospheric pollution contributed to serious haze problems in 1991, 1992 and 1994.

19.09 Steps were taken to ensure that the decline in air quality, due to motor vehicle emission particularly in urban areas, was mitigated. Enforcement efforts by the DOE, Police and Road Transport Department were stepped up to reduce black smoke emission from diesel-powered vehicles. The rate of compliance to the emission standard of 50 Hartridge Smoke Units varied from 77 per cent to 87 per cent in the period 1991-94. The DOE, with the cooperation of agencies such as the Ministry of Health, Police Air Wing, Department of Occupational Safety and Health, Marine Department and Local Authorities, monitored and enforced environmental legislations relating to violations like open burning of waste, effluent discharges, illegal disposal of toxic and hazardous waste and marine pollution. In addition, the inspection of emissions from commercial vehicles was privatized.

19.10 With the relocation of the federal administrative centre to Putrajaya, urban congestion and pollution particularly in Kuala Lumpur and the Klang Valley, is expected to be reduced. In addition, improvement programmes for the Kuala Lumpur and Klang Valley urban transport system were initiated through the implementation of the Light Rail Transit (LRT) system and the consolidation of the public transport system.

CHART 19-1

**EMISSION OF POLLUTANTS TO THE ATMOSPHERE
BY SOURCE, 1987-1995**



Mobile Sources	●	571.1	542.1	572.7	630.8	681.0	1283.1	1283.1	1388.9	1426.7
Stationary Sources	+	364.4	368.2	184.9	197.4	204.4	296.9	293.0	376.2	464.7
Burning of Wastes	*	30.7	23.2	16.5	24.0	25.9	27.7	41.8	83.8	106.7

Notes: Mobile Sources — Vehicles
 Stationary Sources — Power Stations, Industrial Fuel Burning Processes and Domestic Fuel Burning
 Burning of Wastes — Burning of Municipal and Industrial Waste

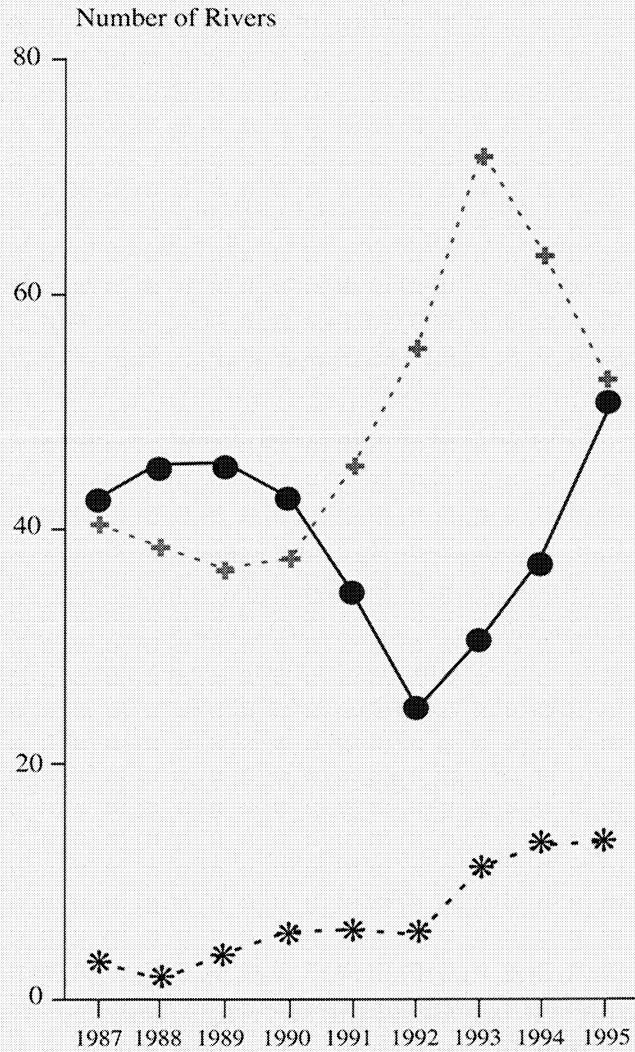
19.11 On 1st January 1990, petroleum refineries reduced the lead content in petrol from 0.84 to 0.15 grammes/litre as required under the Environmental Quality Act (Control of Lead Concentration in Motor Gasoline) Regulations, 1985. To promote the use of unleaded gasoline (ULG), a price differential of three sen was introduced on 1st January 1994. By the end of 1994, ULG constituted 64 per cent of the retail market, contributing to a reduction of lead levels in the air. About 1,000 automobiles, mostly taxis, ran on natural gas for vehicles and experiments were carried out to further test the viability of alternative environment-friendly fuels for commercial usage as well as social purposes. Environment-friendly transport programmes were also promoted.

19.12 *River Quality.* During the Plan period, the number of rivers monitored increased from 87 in 1991 to 119 in 1995. The monitoring used the Water Quality Index (WQI) which appraises water quality on five parameters namely, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand, Ammoniacal Nitrogen, Suspended Solids, and Hydrogen levels. Out of the 119 rivers monitored, 52 were found to be clean, 53 slightly polluted and 14 highly polluted. The number of highly polluted rivers increased from six namely, Sg. Juru, Sg. Benut, Sg. Pontian Besar, Sg. Sepang, Sg. Klang and Sg. Ibai/Marang, to 14, with the addition of Sg. Dondang, Sg. Deralik, Sg. Buloh, Sg. Kempas, Sg. Tukang Batu, Sg. Rambah, Sg. Jejawi, Sg. Sedili Kechil, Sg. Pasir Gudang, Sg. Raja Hitam and Sg. Pontian Kechil. Three rivers, namely Sg. Ibai/Marang, Sg. Benut and Sg. Pontian Besar were recategorized as slightly polluted. Overall, based on the WQI, it was found that river water quality has slightly declined, as shown in *Chart 19-2*. Sewage contributed 65 per cent of water pollution in terms of BOD, while agriculture and industry accounted for 27 per cent and 8.0 per cent respectively. Highlands development and land clearing activities also resulted in an increase in suspended solids and changes in the morphological characteristics of rivers. These activities contributed to increased flooding as well as pollution of coastal and marine areas.

19.13 In order to effectively reduce water pollution from domestic sewage, the Government privatized the sewerage facilities of 143 Local Authority areas in 1993. Other related initiatives carried out included the Sungai Klang Ten-Year Rehabilitation Programme and Love Our Rivers Campaign. Several studies were undertaken to improve the provisions of the Environmental Quality (Sewerage and Industrial Effluents) Regulations 1979 to reduce waste at source from highly polluting industries. Efforts were also initiated to study the impact of uncontrolled exploitation of groundwater, to ascertain the degree of contamination, ground subsidence and potential saline water intrusion.

CHART 19-2

RIVER WATER QUALITY INDEX, 1987-1995



Clean	●	43	46	46	43	35	25	31	38	52
Slightly Polluted	+	41	39	37	38	46	56	72	64	53
Very Polluted	*	3	2	4	6	6	6	11	14	14
Total Rivers Monitored		87	87	87	87	87	87	114	116	119

19.14 *Solid Waste.* Despite the increase in solid waste, Local Authorities were able to sustain a high level of service in waste collection and disposal. The urban population generated about 5.2 million tonnes of solid waste in 1993 or between 0.34-0.85 kilogrammes/capita/day. The estimated amount of solid waste generated in selected Local Authority areas is shown in *Chart 19-3*. However, unsafe solid waste landfills and illegal dumping of waste remained a problem, as enforcement was hampered by the lack of capacity and legal power of Local Authorities.

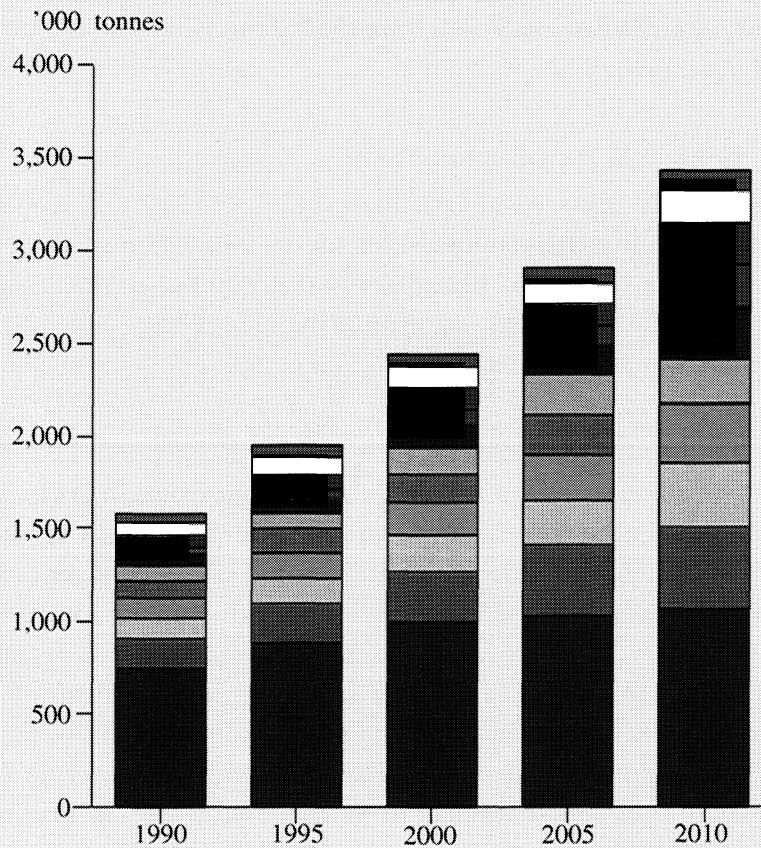
19.15 In an effort towards the improvement and development of solid waste disposal sites, 27 sites were upgraded and 13 sanitary landfills built. In 1993, the Government invited proposals for the privatization of the urban solid waste disposal services of Local Authorities in order to put in place an integrated solid waste management system incorporating recycling and safe environmental management considerations.

19.16 *Hazardous Substances and Waste.* Progress on the management of hazardous substances and waste were made on four fronts, namely, the intensification of enforcement, the preparation of a code of practice, the institution of environmentally sound management of toxic chemicals, and the enhancement of chemical safety, with special reference to banned and severely restricted chemicals. Efforts were made to develop comprehensive legislation to control the use, storage, handling, transport, labelling, and disposal of toxic chemicals. In December 1991, the Government gave exclusive rights to a consortium to build, operate, and maintain a centralized and integrated facility for the collection, storage, treatment and disposal of hazardous waste at Bukit Nanas, Negeri Sembilan. The Government also provided incentives such as tax rebates to industries to adopt clean technology and to promote the recovery and reutilization of waste.

19.17 The rapid growth in production by technology-intensive industries led to an increase in the importation and consumption of chemicals and other chemical-related products, some of which are toxic. The estimated hazardous waste generation for 1992 was 337,000 tonnes. The nine major industrial sources of pollution were metal finishing, electrical and electronics, textiles, food processing, chemicals, palm oil, rubber, wood, and iron and steel manufacturing. They are concentrated in Selangor, Perak, Johor, Pulau Pinang and Wilayah Persekutuan Kuala Lumpur.

CHART 19-3

SOLID WASTE GENERATED BY SELECTED LOCAL AUTHORITY AREAS, 1990-2010



Kangar	■	43	57	68	82	139
K. Bharu	□	66	85	132	146	175
K. Terengganu	■	58	85	119	172	211
Kuantan	■	36	44	67	85	107
Seremban	■	65	95	120	160	224
Melaka	■	94	115	168	215	236
Kota Setar	■	98	128	142	182	229
J. Bahru	■	107	140	180	236	304
Ipoh	■	105	121	164	218	324
P. Pinang	■	155	192	273	355	386
K. Lumpur	■	766	913	1,022	1,058	1,095

19.18 The Malaysian Institute for Nuclear Technology Research (MINT) provided waste management services for radioactive waste from certain industries. MINT developed techniques to reduce, stabilize and immobilize radioactive waste, for their long term storage or permanent disposal. To reduce the adverse impact of pesticides, training was provided to pesticide users and integrated pest management was promoted among users for the cultivation of crops such as rice, cocoa and vegetables. The maximum residue limits of pesticides in crops was determined and enforced under the Pesticide Act, 1974.

19.19 To cater for the sound management of toxic chemicals at the international level, liaison with multilateral and bilateral bodies was further strengthened. In this regard, Malaysia established a Technical Committee on Banned and Severely Restricted Chemicals and a Working Group under the Prior Informed Consent (PIC) procedure of the United Nations Environment Programme/Food and Agriculture Organization. Furthermore, the implementation of the London Guidelines for the Exchange of Information on Banned and Severely Restricted Chemicals in International Trade was closely monitored to protect Malaysia's interest in the trade of restricted chemicals. In order to control the transboundary movements of hazardous waste, Malaysia became a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal, effective from January 1994. Amendments were then made to the Customs Act, 1967 in the Custom's (Prohibition of Import) Order, 1988 and Custom's (Prohibition of Export) Order, 1988 to include a list of chemicals and wastes to be controlled.

19.20 *Energy and the Environment.* Efforts were made to reduce negative impacts on the environment, particularly those caused through the usage of energy. The period, therefore, saw an acceleration in the production and utilization of natural gas in electricity generation as well as in the transport, industrial and commercial sectors. The Government also initiated efforts towards promoting energy efficiency to minimize its polluting effects and encouraging environment-friendly processes and technologies in the industrial and commercial sectors.

19.21 *Oil Spill Incidents.* Monitoring of oil spills in Malaysian waters continued to be a major activity. In this regard, the National Committee on Oil Spill Control was strengthened to increase the effectiveness of the National Oil Spill Contingency Plan in combating oil spills. During the Plan period, 146 major spills were reported, 51 of which were in the Straits of Malacca and 95

in the South China Sea. The biggest oil spill occurred when an oil tanker collided with a container vessel in the Straits of Malacca in September 1992, spilling 13,000 tonnes of crude oil, causing short- and long-term economic and environmental impacts.

19.22 Coordination with the private sector was intensified largely through bodies such as the Petroleum Industries of Malaysia Mutual Aid Group (PIMMAG). This was carried out to ensure the availability of adequate capacity for fighting Tier Two and Three oil spills. Regional cooperation with Brunei Darussalam, Indonesia and Singapore under the Standard Operating Procedure (SOP) for Joint Oil Spill Combat in the Straits of Malacca and Johor was continued. Surveillance of oil spills and desludging by vessels plying Malaysian waters was also undertaken.

Natural Resource Management

19.23 During the Plan period, efforts were continued by the Government to monitor and manage the utilization of natural resources to ensure their sustainable development. As most resources are land based, consultations between the Federal and State Governments were held to ensure coordinated and proper resource management. Mandatory environmental impact assessment (EIA) procedures, introduced in 1987, were expanded with the cooperation of state development agencies to include resource-based development projects.

19.24 *Land Resources.* Several measures were taken to promote the management of land through improved landuse planning. In order to reduce the negative impact of land development such as erosion and landslips, the Town and Country Planning Act, 1976 was amended in 1994. Following the amendment, measures on the conservation of the environment are required in all planning permission applications. The Town and Country Planning Department (TCPD) also provided advisory and management services to the Federal, State and Local Authorities on the development of public parks and landscaping projects as part of its contribution towards improving the environment. In addition, the screening and approval of development plans at the State level were given emphasis through the setting up of State Planning Committees which provided a channel for the coordination and proper management of natural resources. Environmental and resource conservation as well as management considerations for natural and man-made resources were taken into account in the preparation of Structure and Local Plans. By the end of the Sixth Plan period, 64 Structure Plans were completed and 32 more were being finalized.

19.25 *Water Resources.* With the rapid pace of industrial and economic growth, some states experienced water supply strains. In addition, the clearing of highland areas led to the encroachment of upland watersheds, and the resulting sedimentation impeded the development of adequate water flows in rivers. Water loss due to mismanagement of upstream catchment areas continued to remain a problem. As such, efforts were made to introduce the watershed-management concept into the planning and development of water resources in order to ensure a sustainable supply of water and to maintain their long term viability. Development of guidelines to encourage the beneficial use of rivers was also initiated.

19.26 *Forest Resources.* During the Plan period, the area under Permanent Forest Reserve expanded and a total of 14.06 million hectares were identified or gazetted as permanent forest reserves by the end of 1995. The total land area of the country under forest was estimated at 59 per cent while the total under forest and crop cover was estimated at 72 per cent. Projects to rehabilitate forests and establish forest plantations were implemented to ensure continuous supply of timber in the future. To enhance the effectiveness in forestry enforcement, the National Forestry Act 1984 was amended in 1993, and steps were taken to institute the preparation of EIA to protect the forest environment and biodiversity, in particular the logging of natural forests. Reduced impact logging (RIL) was encouraged, and helicopter logging was carried out in Sarawak.

19.27 The development and management of forest resources were enhanced to ensure that they regenerate naturally, provided a sustained supply of timber as well as other resources like clean water, and promote ecological stability. The Malaysian Uniform System and the Selective Management System were used in harvesting forests, and took into account biological, ecological and economic factors to ensure sustainability. In addition, agro-forestry programmes were promoted to uplift the economy of indigenous communities to reduce their dependency on forest. Monitoring of forest resources was carried out with increasing use of remote sensing and Geographic Information Systems (GIS) especially for the third national forestry inventory of Peninsular Malaysia. Efforts were made to increase the marketability of lesser known species and small diameter logs and explore the prospects and value of non-timber products such as rattan and medicinal plants. In research and development (R&D), emphasis was given to applied forest management, resources survey and monitoring, silviculture, reforestation and rehabilitation, environmental studies and forest-based industries.

19.28 *Biological Diversity.* Malaysia is one of the 12 countries in the world identified as a “megadiversity” region. This rich natural heritage is protected within national and marine parks, wildlife reserves and sanctuaries and permanent forest reserves established under various legislation. Biodiversity issues transcend national boundaries, and to exercise a proactive and constructive role in international activities, Malaysia became a party to the Convention on Biological Diversity in 1992. A National Biodiversity Committee was set up in 1994 to protect and manage Malaysia’s biological resources, and to ensure the fair and equitable sharing of biological resources and technology, and to this end a draft National Action Plan has been formulated.

19.29 Malaysia also ratified the RAMSAR Convention on Wetlands of International Importance Especially as Waterfowl Habitat in March 1994, and Tasek Bera, an important wetland area, was added to the list of protected areas as a RAMSAR site. During the Plan period, Sarawak designated 1.03 million hectares of pristine forest as protected areas, and established new National Parks at Batang Ai, Loagan Bunut and Tanjung Datu. The Sabah State Government approved two new conservation areas, namely, Semporna Islands Park and Kinabatangan Wildlife Sanctuary to protect biodiversity, marine and freshwater resources.

19.30 *Soil.* Due to the inadequacy in soil conservation measures, there has been indiscriminate clearing for development projects which caused problems such as soil erosion, air and water pollution. Other major activities which caused soil erosion problems included unsound agricultural practices, logging, mining, industrial and tourist associated development, road construction and massive earthworks. It was found that existing legislation and control measures were inadequate or not fully enforced to abate soil erosion and sedimentation problems. The Schedule of Payment under the Housing Developers Act which govern land and development practices lacks proper environmental dimensions.

19.31 During the Plan period, steps were taken to review and strengthen existing approaches to land development and integrate systematic soil conservation practices at all levels of implementation. The Ministry of Housing and Local Government amended the Street, Drainage and Building Act, 1974 to require measures to minimize soil erosion and sedimentation. In addition, a Soil Erosion Model based on the Universal Soil Loss Equation was developed in 1992 and utilized by the Malaysian Centre for Remote Sensing (MACRES) and the DOE to produce soil erosion risk maps. In order to improve the design and preparation of projects, the use of GIS was expanded to include planning for hill development

projects such as those in Cameron Highlands, Fraser's Hill, Genting Highlands, and for the new federal administrative centre at Putrajaya.

19.32 *Energy and Mineral Resources.* Malaysia continued to sustainably manage its rich endowment of *energy resources*, ranging from fossil fuels such as oil, gas and coal, to renewable resources such as hydroelectric power and biomass. To extend the life of the country's reserves of fossil fuels, the production of oil was limited to about 630,000 barrels per day while in the area of greatest gas utilization, namely Peninsular Malaysia, a gas consumption limit of 2,000 million standard cubic feet per day was adopted. As for its stock of renewable resources, hydroelectric power was prudently developed to optimize on the electricity generated while minimizing the negative impacts on the environment. Another source of energy, solar power, was developed and promoted in remote areas.

19.33 The sustainable development of the nation's *mineral resources* was guided by the National Mineral Policy which was formulated in 1992. In line with this, the Mineral Development Act, which deals with regulatory aspects of exploration and mining, was gazetted in 1994. A model State Mineral Enactment, encompassing enhanced environmental considerations and procedures and applicable to all States, was also formulated to standardize procedures and make the mineral sector more attractive for investment. In addition, land already mined were rehabilitated and used as recreational areas or utilized for fish rearing activities. Together, such programmes optimized mineral exploitation and minimized wastage.

19.34 *Coastal and Marine Resources.* Malaysia has a long coastline and associated coastal zone with one of the most diverse marine life and resources in the world. The coastal zone supports a large percentage of the population and is also the centre of economic activities. The rapid pace of development activities, poor siting, planning and design of coastal development projects, however, has begun to give rise to problems. Economic pressures have led to the indiscriminate cutting of mangrove forest for aquaculture, agriculture and tourist development projects and to the exploitation of coastal resources above sustainable level, especially along the west coast of Peninsular Malaysia. In addition, rapid industrial development of the hinterland has increased the organic and inorganic pollution to rivers and coastal waters. The loss of mangrove and other wetland forests, which function as breeding grounds for a large variety of fish and prawn species, has resulted in a decline of fisheries resources. The loss also impaired the function of wetlands as reservoirs, which is important during heavy rains to help prevent the occurrence of flash floods.

19.35 Efforts were taken to protect and rehabilitate critical areas and fish breeding grounds. As a result, 38 islands were gazetted as marine parks, with six other islands gazetted as fisheries prohibited areas. Marine parks played an important role in reconciling the conflicts between tourism, fisheries and other coastal activities and in arresting the loss of natural habitats in the coastal zone. Apart from these efforts, about RM100 million was spent in the Sixth Plan period to protect approximately 29 per cent of the country's coastline which was still subjected to erosion.

Other Initiatives

19.36 *Education and Public Awareness.* During the Sixth Plan period, various government agencies, non-governmental organizations (NGOs) and private sector bodies implemented environmental education, training and awareness programmes. Despite these efforts, the level of environmental awareness among Malaysians has been found to be generally low.

19.37 As such, the Government adopted a long-term strategy to carry out environment education through a multi-disciplinary approach in order to provide a holistic view and understanding of the environment. Environmental dimensions were introduced into the curriculum of pre-schools, primary and secondary schools, and higher institutions of learning, as well as teacher training colleges. Textbooks were revised to incorporate environmental values and ensure that environmental facts were correct. These were complemented by environment-based co-curricular activities. Undergraduate and postgraduate courses in environmental sciences were offered by the various universities, which also set up centres for environmental research and in-service training.

19.38 On the industrial front, the Standards and Industrial Research Institute of Malaysia (SIRIM) embarked on a cleaner technology programme with focus on environmental problems of small- and medium-scale industries (SMIs). Local Authority personnel were also given training to provide them with a better understanding of solid waste management.

19.39 In the non-formal sector, there was an increase in the scope of activities and awareness programmes organised by both the private sector and NGOs. They comprised programmes for school children, quizzes, and other awareness campaigns, such as the Love Our Rivers Campaign, Tree Planting Campaign, Clean and Beautiful Campaign, the Haze Awareness Campaign, as well as campaigns to educate the public on resource conservation. These were supplemented

by exhibitions and various activities organised by the government in cooperation with the media, NGOs and the private sector to increase public environmental awareness.

19.40 A Business Council for Sustainable Development Malaysia (BCSDM) was set up in 1992 to establish a business community which is fully committed to the care of the environment. It promoted environmental management as a corporate priority and in 1995 launched a Sustainable Development Award for companies that met the BCSDM's criteria for sustainable development practices. In addition, the Malaysian International Chamber of Commerce and Industry supported the "Business Charter for Sustainable Development" of the International Chamber of Commerce, which contains 16 principles that address environmental problems. The private sector also initiated campaigns on product recycling and disposal for items such as aluminium cans, plastics, paper and bottles.

19.41 The DOE published various forms of environmental information to further educate the public on current environmental issues and on how they can help care for the environment. DOE also produced video documentaries and exhibition materials for schools and other relevant agencies. The National Film Department undertook similar activities. The environment continued to be a regular feature in the print and electronic media, where environmental issues as well as conservation activities and interests were highlighted.

19.42 *International and Regional Cooperation.* Malaysia played an active role in the process leading up to the UNCED which was held in Rio de Janeiro, Brazil in June 1992. From UNCED's deliberations, an action plan that presented a set of integrated strategies and detailed programmes to halt and reverse the effects of environmental degradation and to promote environmentally sound and sustainable development, was drawn up. This action plan, known as Agenda 21, formed the basis for action by the international community to integrate environment and development, with its implementation being monitored by a Commission on Sustainable Development (CSD). Malaysia was elected the first Chairman of the CSD and was the first country to host a national seminar as a follow-up to the Rio meeting.

19.43 In line with its commitment to Agenda 21, Malaysia signed the Framework Convention on Climate Change (FCCC), the Convention on Biological Diversity, the Basel Convention on the Transboundary Movement of Toxic and Hazardous Wastes and Their Disposal, the RAMSAR Convention and the Convention on Desertification. Malaysia also established mechanisms for their

implementation and continued with its efforts to implement UNCED decisions as well as other international conventions such as those concerning Ozone Depleting Substances (ODS), forestry issues as well as straddling and highly migratory fish stocks.

19.44 At the end of 1991, consultations on trade and environment in the General Agreement on Tariffs and Trade (GATT) were concluded and the Group on Environmental Measures and International Trade was convened. At the follow-up Marrakesh Ministerial Decision on Trade and Environment in 1994, the linkages between trade, environment and sustainable development were pushed as a priority in the World Trade Organization (WTO). To address concerns that environmental issues were not used to disguise underlying protectionist motives and measures, a national committee was set up to examine the implications of the new rules and formulate appropriate responses with regard to environmental issues in international trade.

19.45 In line with Malaysia's ratification of the Montreal Protocol for the Protection of the Ozone Layer to phase out CFCs, a national strategy for the reduction of Ozone Depleting Substances was formulated. In addition, a grant from the Protocol's Multi-Lateral Executive Fund was provided to assist the private sector in phasing out the use of CFCs. Participation by the private sector has been encouraging and by the end of 1995, 66 Ozone Depleting Substance projects worth about RM55 million were approved. Malaysia also ratified the Framework Convention on Climate Change (FCCC) in 1994 and subsequently, a National Climate Committee was formed to formulate policy and initiate programmes to carry out scientific research related to global warming and sea level rise, as well as their socio-economic impacts.

19.46 Malaysia continued to express its concern over the shortfall in the transfer of financial resources and environment-friendly technologies from the North to the South. The contribution of developed countries to Official Development Assistance (ODA) was far short of the pledge of 0.7 per cent of GNP made at UNCED. The transfer of technology at reasonable cost has yet to be effected, and it is necessary for the South to pressure the North to fulfill their commitments for shared responsibility. Other areas of concern included the Joint Implementation (JI) under the FCCC which seeks to commit developing countries to provide carbon sinks for the emissions of developed countries. Malaysia played an active role in reshaping the definition of the JI criteria and conditions of implementation in the International Negotiating Committee of the FCCC in order to safeguard the interests of developing countries.

III. PROSPECTS, 1996-2000

19.47 During the Seventh Plan period, the Government will continue to keep the balance between growth objectives and environmental concerns. Environmental considerations will increasingly be integrated in the formulation of sectoral policies in order to ensure sustainability of economic and social development. Besides acquiring the requisite technical capacity, appropriate policy and planning capability will be put in place to deal with complex environmental problems. Early preventive measures such as the application of the precautionary principle, the use of more efficient and cost-effective pollution control measures through R&D efforts and the acquisition of clean technology, will be encouraged to achieve the desired level of pollution abatement. Approximately RM1.9 billion will be allocated in the Government's development budget to improve and protect the environment as well as to conserve and promote sustainable resource use. These efforts by the Government will be complemented and supplemented by investments from the private sector in the field of environment and natural resource management. The private sector will be urged to improve its operations within the context of increasing productivity of both human and natural resources. Efforts will also be undertaken to create niches in environmental products and technologies in which Malaysia will be able to achieve comparative advantage and cater to the growing international demand.

19.48 *National Policy on the Environment.* Environmental and natural resource management under the Seventh Plan period will be guided by the National Policy on the Environment, which is being promulgated to ensure long-term sustainability and improvement in the quality of life. The policy aims at promoting economic, social and cultural progress through environmentally sound and sustainable development. The objectives of the Policy are:

- (i) to achieve a clean, safe, healthy, and productive environment for both present and future generations;
- (ii) to conserve the country's unique natural resources and diverse cultural heritage with effective participation by all; and
- (iii) to promote lifestyles and patterns of consumption and production consistent with the principles of sustainable development.

19.49 The essence of this Policy is based on seven inter-related and mutually supporting principles which have been identified as:

- o Stewardship of the environment;

- o Conservation of nature's vitality and diversity;
- o Continuous improvement in health, safety and the quality of the environment for sustained human development;
- o Integration of sustainability in all development decisions;
- o Commitment and accountability;
- o Rational and efficient use of natural resources; and
- o Active participation in the community of nations.

19.50 A Plan of Action will be drawn up to operationalize the different aspects of the National Policy on the Environment. Focus will be given to providing a framework for an integrated approach to development, enhancing the effectiveness of the regulatory and institutional framework, recommending suitable mitigation measures, improving environmental education, communications and awareness, and training programmes as well as incorporating environmental considerations in resource management and development planning.

19.51 With the increasing emphasis towards an integrated and preventive approach, the *institutional framework* will be strengthened to ensure the provision of adequate capacity to undertake planning, regulatory and enforcement functions, training and education as well as R&D. Environmental considerations will be further integrated into decision-making at the Federal, State and Local Authority levels.

19.52 During the Plan period, the *legislative* mechanism will be streamlined at various levels as an integral part of overall project planning in order to reduce the adverse environmental impact of proposed projects. Following the recommendations of the Law Review Committee, provisions under the Environmental Quality Act, 1974 will be amended to provide stricter regulation and stiffer penalties covering areas such as increased maximum fines, power to close factories, and mandatory compensation for victims. This legal and regulatory framework will be complemented by the use of innovative economic and tax instruments such as presumptive charges which collect payment based on presumed annual total pollution discharge, forest taxes based on impacts of different types of activities, pollution charges based on levels of compliance, exemptions on import duty, sales tax and special capital allowance for importation of environment-friendly machinery. Studies are being done to determine appropriate instruments and incentives which can be applied to highly polluting sectors.

19.53 With regard to *monitoring and enforcement*, surveillance capability will be strengthened. The penalty structure related to environment offences will be revised to ensure more effective deterrence, especially to repeat offenders. Airborne surveillance capacity will be enhanced and a water quality monitoring network will be developed to enhance in situ measurement, monitoring and tracking of pollution sources, both on land and at sea. In addition, to overcome the shortage of existing enforcement staff and to increase the effectiveness of enforcement effort, the enforcement function of agencies such as the DOE, Health Department, Pesticide Board and Local Authorities, will be rationalized and streamlined and adequate training will be provided to their enforcement staff.

Environmental Management

19.54 *Air Quality*. Based on studies carried out during the Sixth Plan period to improve air quality, a number of strategies will be implemented in stages during the Seventh Plan, covering the following areas:

- o Energy: To utilize less polluting energy sources such as low sulphur content fuels and renewable energy, especially solar;
- o Transport: To strictly control emissions from motor vehicles including motorcycles to improve urban air quality through the use of cleaner diesel engines, and efficient exhaust systems; institute comprehensive traffic management systems; implement inspection and maintenance programmes for all vehicles prior to renewal of licences; and promote the use of electric vehicles especially in urban areas to reduce total pollution load;
- o Industry: To promote the use of clean technology, pollution control equipment, alternative fuels, proper siting of industries, and the setting up of central disposal facilities for industrial wastes. Assistance will be provided, especially to SMIs, to enable them to develop and adopt appropriate and affordable techniques that comply with the required standards;
- o Housing: To create a green environment through tree planting and landscaping, to promote sound construction practices, reutilization of construction wastes and to encourage the use of incinerators for municipal wastes;

- o Agriculture: To promote sound cultivation practices, reutilization of agricultural wastes and zero burning;
- o R&D: To conduct research into effects of air pollution on health as well as on the economy and local environment; and
- o Manpower and Training: To intensify formal and informal training for all levels of personnel from the public and private sectors in the requirements and techniques of project formulation to prevent adverse environmental impacts as well as methods of controlling environmental degradation during implementation.

19.55 In accordance with the national strategy on reducing ODS, the Government will continue to work with major industrial users to control and reduce the consumption of CFCs and halon as well as identify suitable alternatives and relevant technologies for the automobile air-conditioning, refrigeration, cleaning agent, aerosol propellant and halon industries. The import and use of ODS are expected to be phased out ahead of internationally agreed schedules.

19.56 *River Quality.* In order to improve the effectiveness of river systems management, the responsibility for river management is envisaged to be increasingly taken over by the State Governments, as in the case of the Water Resources Council of Sarawak. An appropriate mechanism will be instituted to improve water resource planning and development of catchment and watershed areas to ensure adequate and clean water supply. Arrangements will be made at the Federal and State levels to determine the institutional, legal and financial mechanisms in carrying this out. GIS and remote sensing will be used in combination with water-quality models for the promotion of effective river and catchment management. At the industry level, more stringent standards will be introduced to require the installation of better waste-water treatment facilities and the imposition of fees will be considered for waste-water discharge. In the case of groundwater, new regulations will be developed to safeguard water quality and regulate usage.

19.57 *Solid Waste.* Solid waste disposal will be privatized to a consortium and under this proposal, an integrated waste management system will be adopted to minimize environmental degradation. By the year 2000, the amount of solid waste generated is expected to exceed nine million tonnes annually and this will require greater operational capacity. Towards this end, efforts in waste reduction will be given the highest priority. More modern waste-processing

technologies at the upstream portion of waste management will be used in conjunction with alternative waste-management methods such as composting, recycling and incineration with energy recovery. The use of waste incineration will be widely promoted in major urban centres and made part of island resorts development plans. Studies will also be carried out to determine efficient ways of disposing industrial solid and oil waste. In addition, the Government will streamline laws and regulations at the Federal, State and Local levels to ensure proper solid waste disposal including mandatory separation of recyclable waste by households. As regulatory bodies, Local Authorities will be expected to establish better design and operational standards of waste management sites.

19.58 *Hazardous Substances and Waste.* The privatized facility for the storage, treatment and disposal of toxic and hazardous waste at Bukit Nanas, Negeri Sembilan is expected to be operational by 1998. It will have a capacity to handle 400,000 tonnes of toxic waste which constitutes about 90 per cent of the expected discharge from industrial activities. To support and facilitate the collection and storage of waste, transfer stations will be built in Pulau Pinang, Johor, and Terengganu. Specialized and safe transport vehicles will be used as part of the integrated toxic and hazardous waste management system.

19.59 Existing environmental protection measures, laws, regulations, and guidelines will be reviewed to improve their effectiveness in controlling toxic chemicals. These will be complemented by the provision of further incentives for the proper management of hazardous waste and the promotion of cleaner technology and processes. Public sector R&D agencies will focus their efforts towards identifying suitable and effective disposal systems and technologies, training of relevant personnel, and instilling greater awareness among the public and relevant industries. Malaysia will strengthen its support of international efforts to prevent illegal trafficking of toxic and hazardous products and adhere to the implementation of the relevant international guidelines, including those agreed under the Basel Convention. For radioactive waste management, potential repository sites will be identified to accommodate the increased capacity required for storage and conditioning.

19.60 The Pesticide Board and related agencies will be strengthened to ensure that only recommended pesticides are used, and to monitor pesticide residue in the environment and take appropriate follow-up actions. Legislation will be reviewed to control the field application of pesticides as well as the disposal of pesticide containers. Environment-friendly farming methods such as organic

farming and the use of non-chemical methods of pest management such as biological control, will be promoted. Programmes to train and educate pesticide users on the safe handling of pesticides including aspects of environmental protection will be intensified.

19.61 *Energy and the Environment.* The focus of the energy policy will be on supplying energy efficiently and on a least-cost basis. In line with the energy diversification policy, the use of natural gas will be expanded for industrial, commercial and residential use. R&D into sustainable energy sources, improved energy efficient technologies and practices as well as the development of new and renewable and environmentally-sound energy sources, will be promoted. Appropriate measures will be introduced to promote energy efficient processes through commercialization of new and renewable sources of energy. Consideration will also be given to reform the existing energy production pattern which is heavily centralised and reliant upon large-scale systems, as dispersed energy systems can satisfy energy needs more economically and with a lower environmental burden.

Natural Resource Management

19.62 During the Plan period, Malaysia will emphasize the long-term management of its natural resource base to ensure their sustainable use and development. The National Conservation Strategy (NCS) will be used as the framework for a comprehensive approach to natural resource development. The objectives of the NCS are:

- (i) to conserve natural resources in order to maintain ecological processes, preserve biological diversity, and restore degraded natural resources in a cost-effective manner;
- (ii) to use natural resources in a sustainable manner as well as to ensure that non-renewable resources are extracted at rates that do not exceed the creation of substitute capital resources; and
- (iii) to improve efficiency in resource use and management, give higher priority to renewable resources already exploited, and prevent deterioration of fragile ecosystems with large downstream influences.

19.63 As part of the natural resource management strategy, the Government will consider the development and application of a Natural Resource Accounting System to provide indications and feedback regarding the sustainability of the

rates of resource use. This system which monitors the extraction and utilization of natural resources will ensure that corrective action could be taken where necessary to prevent unsustainable use of the nation's resources.

19.64 *Land Resources.* During the Plan period, environmental considerations will be integrated into landuse planning. Environmental dimensions will be incorporated into national spatial and regional development plans and existing structure plans. To reduce the negative impact of development and rapid urbanization, efforts will focus on the dispersal of socio-economic activities, improved public transport capacity and the reduction of waste and emissions.

19.65 As the process of strengthening landuse planning will require support from all State Governments, the National Land Council will play a bigger role in landuse issues and facilitate the adoption of a comprehensive and coordinated approach in landuse planning. This will be complemented by expanding the use of economic instruments to encourage State Governments to adopt environmentally-sound landuse practices. These economic instruments include the provision of incentives and soft loans to promote the application of environmental and conservation measures in land development.

19.66 The Government will establish a National Land Information System (NALIS) as the main source of land-related data. The Land Capability Classification will be updated to facilitate landuse planning. These information systems will be complemented by the further development of remote sensing capabilities which will be utilized to evaluate the natural resource endowment efficiently and to better manage land resources.

19.67 *Water Resources.* Domestic and industrial water demand is expected to grow to 3.7 billion cubic metres (bcm) by the year 2000 from 2.6 bcm in 1990, and demand for irrigation water will grow to 10.4 bcm from 9.0 bcm. The search for an adequate supply of water will necessitate the building of dams further upstream and an increased use of groundwater. It is envisaged that any new water supply development will require heavy investment because of more limited and remote sources, larger reticulation systems and higher cost of treatment. In this regard, watershed areas will need to be protected to ensure that their potential use is not jeopardized. State Governments will coordinate efforts to prevent excessive groundwater exploitation and pollution. The Government will update the 1982 National Water Resources Study to provide guidance in the preparation of water resource master plans, water catchment zoning plans,

a database on water resource management, and to implement the required efficiency improvements. The Government will also study the setting up of a suitable mechanism to resolve legal, institutional and financial matters relating to water.

19.68 *Forest Resources.* The development of an environmentally-sound harvesting system will be the most important factor towards achieving sustainable management of the permanent forest estate and for Malaysia to maintain a forest cover of at least 50 per cent in the long-term. Other policy options will include the requirement for EIAs in prescribed forestry activities; taxes in the form of forest premiums; royalty and silvicultural cess; subsidies for setting up forest plantations; pollution charges on forestry activities that are damaging; rehabilitation of forests; and expansion of the network of protected areas to include more ecosystems, species and centres of endemism. Information regarding the status of logged areas in the permanent forest reserves will be collected during the Plan period for the formulation of a logging schedule until the year 2000.

19.69 To improve the effectiveness of enforcement on illegal logging, a Task Force will be set up to coordinate the activities of agencies involved, namely, the Forestry Department, the armed forces and the police. It will be responsible for making frequent checks on logging activities in the states. Aerial surveillance will also be intensified.

19.70 Malaysia is gearing itself to fulfilling its commitments to the International Tropical Timber Organisation (ITTO) Objective Year 2000, when all timber traded in the international market must be produced from forests that are sustainably managed. In addition, proposals to implement ecolabelling and timber certification on forest products will be studied carefully. Malaysia will step up efforts towards managing and developing its forests in line with the guidelines, criteria and indicators formulated by ITTO.

19.71 R&D efforts will be stepped up to ensure fuller utilization of timber products and the downstream processing of wood wastes into products such as flakeboards, particle boards and charcoal briquettes. The level of timber production will be maintained through reduced forestry wastage as well as increased efficiency in processing. Production from forest plantations and the processing of rubber wood are expected to supplement the production of timber from natural forests.

19.72 *Biological Diversity.* Efforts will be intensified to document the species that exist and strengthen in situ and ex situ conservation of biodiversity through the storage of germ-plasm in gene banks, the setting up of an arboretum and a botanical garden. In order to create more biodiversity reserves, permanent forest estates will be enlarged to cover land not required for other forms of development. Critical habitats, such as highlands, mangroves and peat swamps which are not adequately represented among existing protected areas, will be identified and gazetted for protection. Wetlands such as Tasek Bera and other areas to be identified will be protected and designated as RAMSAR sites. The issues and implications of biosafety arising from genetically-modified organisms and trade-related intellectual property rights will be addressed.

19.73 *Soil.* During the Plan period, steps will be taken to systematically integrate soil conservation planning with physical development, and review current legislation and guidelines governing land development in relation to soil conservation. The existing Schedule of Works and Payment under the Housing Developers Act will be amended to incorporate environmental factors, and a soil erosion standard will be drawn up for earthworks, land clearing and agricultural activities, with specifications for critical slopes and gradients. The existing Guidelines for the Management of Land to Control Soil Erosion and Siltation will be reviewed and the need for a Soil Conservation and Sediment Control Act will be studied. At the same time, the use of the National Land Code to prevent soil erosion and promote soil conservation will also be explored. Other regulations which will be amended include the Environment Quality Act, 1974, the Town and Country Planning Act, 1976, the Uniform Building By-Laws, 1984 and the Housing Developers (Control and Licensing) Regulations, 1989. The use of geo-technical information will be intensified to mitigate and prevent hazards due to rapid expansion in the rate of construction of high-rise buildings and in the implementation of large infrastructure projects.

19.74 *Energy and Mineral Resources.* The development of *energy resources* will continue to contribute to the nations's economic expansion. Measures will continue to be undertaken to ensure a timely schedule for the transition away from the reliance on oil. The substitution of oil and the diversification of energy supply will be based on available indigenous resources such as gas, hydroelectric power, coal, and other forms of non-conventional energy. The national depletion policy on oil and production limit on gas in the peninsula will continue to be adhered to as a measure to maximise the lifespan of these depletable resources. R&D in the search for clean energy sources as well as clean combustion methods will be emphasized.

19.75 With the implementation of the National Mineral Policy, it is envisaged that there will be an increase in exploration and mining activities in the country. Steps will be taken to upgrade technologies in exploration, mining and processing; mitigate negative environmental impacts; set up a national inventory for prudent land use planning and management as well as improve linkages with the State Governments to ensure that valuable *mineral resources* are not exhausted prematurely. The State Mineral Enactment, a standardized enactment applicable to all states, will be presented to the State Governments for adoption. The use of technology such as GIS and remote sensing, will be maximized for effective planning, management and investment promotion in the mineral sector. A one-stop mineral resources information centre will be established to provide information to investors on mineral extraction. This centre will also assess the use of local and imported metallic and industrial minerals required for development purposes.

19.76 *Coastal and Marine Resources.* A national coastal zone management policy will be formulated to provide clear principles and guidelines for resolving the conflicting interests among different types of development in coastal areas as well as to take into account environmental considerations to ensure sustainability of coastal resources such as mangroves and peat swamp forest. Under the policy, integrated coastal zone management plans will be drawn up to coordinate and rationalize the activities and efforts of the various Federal, State and Local Authorities responsible for planning and managing resources found in the coastal zone. In addition, the legal provisions that govern the management of coastal resources and related development activities, especially with regard to aquaculture, sand-mining and groundwater, will be reviewed to ensure better coordination and implementation. A National Islands Development Board will be set up to issue policy guidelines on island and coastal development in order to reduce the detrimental impact of development activities on island ecosystems. Additional protection will be accorded by including tourism and recreational activities in the list of EIA prescribed activities.

Other Initiatives

19.77 *Education and Public Awareness.* The commitment of the individual Malaysian to the protection of the environment is a critical element in laying the foundation for Malaysia's sustainable development. The relevant ministries will develop policies, strategies and programmes on environmental education, awareness and training. The imparting of knowledge and instilling of awareness

is expected to help Malaysians adopt a more environment-friendly lifestyle and consumption habit. Environmental ethics and a sense of responsibility will be inculcated, and the population will be encouraged to take an active role in the protection and maintenance of the environment. The private sector, NGOs and the media will be encouraged to play a bigger role to complement the Government's efforts in this endeavour.

19.78 The thrust during the Plan period will be to enhance the level of environmental awareness and commitment among the population through the formal education system; participation, involvement of and leadership by environmentally-committed organizations, NGOs and businesses; and the development of coherent broad-based campaign themes. Recognizing the need for environmental education to be made a life-long process, greater use will be made of the media to cover environmental events and issues and broadcast environmental messages to schools and the public.

19.79 To establish a culture of responsibility towards the environment by industries and businesses, and encourage the private sector to take on a major role in promoting public awareness, the Government will actively seek partners in the corporate sector to adopt as well as to promote environmentally responsible practices and processes. In addition, environmental auditing which offers the opportunity for greater efficiency and competitiveness arising from savings due to lower resource utilization and wastage reduction, will be promoted among businesses. Seminars and workshops will be organised to introduce top management to the benefits of environmental auditing and to provide training in its implementation.

19.80 SIRIM will set up a Cleaner Technology Extension Service (CTES) to conduct environmental audits and establish demonstration projects on cleaner technologies. In addition, an information centre for cleaner technology will be established to collect and disseminate information on cleaner industrial technologies, and to help increase general environmental awareness. A database on "reference figures" will be developed for use in environmental audits. Assistance will be provided to SMIs in adopting cleaner technologies.

19.81 *Data and Information.* The environment database and information systems will be strengthened to clearly delineate the relationship between the environment and sustainable development. The Department of Statistics will be made the central depository for environmental statistics, which will be compiled from all existing line agencies. Both central and line agencies will in turn

upgrade their database through an improved collection and information system. The Malaysian Centre for Remote Sensing will provide real time monitoring of the environment and natural resources through the use of satellite and other remote sensing sources. Efforts will be initiated to prepare indicators of sustainable development that will provide a yardstick for monitoring and evaluating progress.

19.82 *Monitoring Health Impacts.* As health implications of pollution are essential in conducting a cost-benefit analysis of abatement policies and implementing cost-effective measures, an Environmental Health Centre will be set up to investigate health impacts of environmental problems, collect health statistics, develop Malaysian-specific dose-response functions, conduct research and recommend measures for alleviating health problems. It will coordinate environmental-related health research undertaken by different institutions in the country, and carry out additional R&D to derive more conclusive results.

19.83 *Trade and Environment.* To reconcile trade and environment conflicts and promote sustainable development, the coordination of international trade and environmental protection policies will be given high priority during the Plan period. The Committee on Trade and Environment will seek to rationalize the relationship between trade-related environmental policies and environmental measures with significant trade effects; the effect of environmental measures on market access; the use of trade measures to attain environmental objectives; and ultimately the competitiveness and sustainability of production. Efforts will be stepped up by relevant ministries to enhance the understanding, perception and acceptance of trading partners regarding national products such as tropical timber through consultations, dialogues, seminars and Government missions. Appropriate common positions and approaches will be developed with ASEAN countries in addressing these problems.

19.84 While the Government will play a proactive role in formulating policies and strategies to promote fair and equitable treatment in international trade, the private sector will need to keep abreast with the new rules in the trading arena. It will need to be equipped with the ability to adapt to economic instruments as well as environmentally-related product standards and technical regulations, such as the ISO 14000, packaging, labelling, recycling, and intellectual property rights requirements, in order to maintain and improve competitiveness. The private sector will also be encouraged to develop niches in environmental technologies and products in view of the expected increase in the demand for these technologies and products.

IV. CONCLUSION

19.85 During the Sixth Malaysia Plan period, the Government reviewed the legislative framework and carried out programmes to prevent and combat pollution as well as conserve natural resources. Malaysia also played an active role in the UNCED and other international processes in order to bring about the adoption of an international agenda for sustainable development and to overcome transboundary pollution problems. Mechanisms were also set up to implement the commitments of international conventions.

19.86 Malaysia will continue to place emphasis on the proper management of the environment and natural resource base during the Seventh Malaysia Plan period. Environmental considerations will be integrated into the development planning process to give due emphasis to the need for sustainable development. A comprehensive approach, which takes into account the population's socio-economic needs as well as the enhancement of the quality of life through improvements in productivity and the natural environment, will be adopted. A combination of legislative and innovative economic instruments will be used to encourage the adoption and development of environmentally-sound technologies and environment-friendly products. The Government will step up environmental education and public awareness programmes, in cooperation with NGOs and the private sector, to educate the public on environmental and conservation issues and on the need for all parties and the Government to work closely to realize the goal of sustainable development.

